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# Demographic and Risk Factor Profile of Patients with HIV Positive Attending an ICTC Centre at Peri-Urban Region of Haryana, India- A Four-Year Study

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**ABSTRACT**
*Human Immunodeficiency Virus infection is a world-wide pandemic. The data generated by Integrated Counselling and Testing Centre (ICTC) may provide important insight into the epidemiology of the disease, as well as pattern of risk behaviour of the population. A retrospective study was carried out at the Integrated Counselling and Testing Centre (ICTC), SGT Medical College and Hospital, Haryana. Present study have included all the attendees of Integrated Counselling and Testing centre over a period of 4 years (2017–2020). A comparative analysis of sociodemographic and risk factor profile between HIV positive ICTC attendees from urban and rural areas was performed. Data collected were analysed using Microsoft Excel. Statistical analysis was done using IBM SPSS, p value < 0.05 was taken as significant. Total ICTC attendees in last 4 years (2017-2020) were 18,300 out of which total HIV-I seropositive cases were 0.38%. Majority (56.3%) of seropositive patients were from rural areas where as 39.4% were from urban region. Most of the HIV seropositive patients belonged to the age group of 21-40yearsfrom both urban and rural areas, were unemployed or belonged to bridge population (p = 0.001). Sexual transmission followed by intravenous drug abuse were found to be the most common mode of transmission. ICTC provides comprehensive services for identification and documentation of HIV and its related risk factors. This is first study from a peri-urban area analysing socio-demographic and risk factor profile among HIV positive ICTC attendees, providing a comparison between patients from urban and rural areas and the impact of COVID-19 pandemic.*
***Keywords****: HIV, NACP IV, ICTC, pandemic*

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## INTRODUCTION

Human Immunodeficiency Virus infection is affecting worldwide.[1].It is a major concern for public health which has adverse effects on developmental and socio economic consequences as it primarily affects economically productive and the sexually active population of any country [2].

India has the, third largest population of Human Immunodeficiency Virus positive individuals in the world [3].Approximate estimation suggests that among Human Immunodeficiency virus affected population ,67% belongs from rural region of India, risk factors associated with HIV infection in rural areas are not well known [4].Studies in rural areas are difficult to perform due to limited access, restrained resources, isolation of the communities & lack of medical institutions in and around the area. Most of the studies in India have been performed by institutions catering to urban populations, therefore, there has been an underrepresentation of the rural population in previous epidemiological investigations [4,5].Present study was conducted in SGT Medical college and hospital spread over 70 acres of lush green campus. It is located in a peri urban area of Haryana; which is a landscape interface between town and country. The population characteristic of the region comprises of mix of residents from both rural and urban areas.The present study was conducted to find out the socio demographic characters and risk factors associated with HIV infection among study subjects (rural and urban) attending a peri-urban ICTC centre.

## MATERIAL AND METHODS

A retrospective study was carried out at the Integrated Counselling and Testing Centre (ICTC), SGT Medical College and Hospital, Haryana. Prsent study included all the attendees of Integrated Counselling

and Testing Centreover a period of 4 years (2017–2020). Serodiagnosis of HIV was made based on strategy 3 (used for diagnosis in asymptomatic patients) under National AIDS Control Program IV (NACP IV). In case of HIV positive individual, the patient was referred to higher centre for CD4 count and initiation of anti-retroviral treatment. Approval was obtained from the Institutional Scientific and Ethics Committee. Several unlinked and anonymous information was collected, as per the National AIDS Control Organization guidelines from there cords available with the counsellor who has interviewed the attendees under strict confidentiality conditions. The demographic details were obtained which included age, gender, qualification, marital status, occupation and self-reported route of transmission or related risk. This study presents an analysis of sociodemographic and risk factors associated with HIV positive ICTC attendees from both urban and rural areas. Data collected were analysed and proportions were calculated using Microsoft Excel. Statistical analysis was done using IBM SPSS, p value < 0.05 was taken as significant.

**RESULTS**

Total ICTC attendees in last 4 years (2017-2020) were 18,300 out of which totalHIV-I seropositive cases were 0.38% (71/18300). Seropositivity rates observed over the years have been depicted in figure 1. Lowest HIV seroprevalence was noted in 2018 (0.15%)

Majority of seropositive patients were from rural areas 56.3% (40/71) where as 39.4% (28/71) were from urban region.Most (62.5% in rural and 60.7% in urban) of the HIV seropositive patients belonged to the age group of 21-40years, followed by 41-60 years (35% in rural and 28.5% in urban).

**Table 1: Socio-demographic and risk factor profile among ICTC attendees from rural and urban areas**

| PARAMETER | GROUPS | RURAL (N=40) | % | URBAN (N=28) | % | Chi-square | p-value |
|---|---|---|---|---|---|---|---|
| Age | Up to 20 years | 0 | 0 | 1 | 3.5 | 2.45 | 0.484(NS) |
| | 21-40 years | 25 | 62.5 | 17 | 60.7 | | |
| | 41-60 years | 14 | 35 | 8 | 28.5 | | |
| | Above 60 years | 1 | 2.5 | 2 | 7.1 | | |
| Sex | Males | 28 | 70 | 21 | 75 | | |
| | Females | 12 | 30 | 7 | 25 | | |
| Marital Status | Married | 31 | 77.5 | 19 | 67.8 | 1.07 | 0.784(NS) |
| | Unmarried | 6 | 15 | 7 | 25 | | |
| | Separated | 3 | 7.5 | 2 | 7.1 | | |
| | Widowed | 0 | 0 | 0 | 0 | | |
| Education | Illiterate | 9 | 22.5 | 6 | 21.4 | 1.42 | 0.701(NS) |
| | Primary school | 10 | 25 | 4 | 14.2 | | |
| | High school | 18 | 45 | 16 | 57.1 | | |
| | Graduate | 3 | 7.5 | 2 | 7.1 | | |
| Occupation | Unemployed | 11 | 27.5 | 3 | 10.7 | 28.88 | 0.001(S) |
| | Driver | 5 | 12.5 | 3 | 10.7 | | |
| | Daily wages/others | 12 | 30 | 2 | 7.1 | | |
| | Homemaker | 12 | 30 | 5 | 17.8 | | |
| | Not specified | 0 | 0 | 15 | 60 | | |
| Route of transmission | Sexual transmission | 34 | 85 | 22 | 78.5 | 1.71 | 0.635(NS) |
| | IV users | 3 | 7.5 | 2 | 7.1 | | |
| | Blood transfusion | 0 | 0 | 0 | 0 | | |
| | Parent to child | 0 | 0 | 1 | 4 | | |
| | Not specified | 3 | 7.5 | 3 | 10.7 | | |
| oinfection | TB | 3 | 7.5 | 3 | 10.7 | | |
| Seroconcordent couple | | 3 | 7.5 | 4 | 14.2 | | |

Males outnumbered the females among the seropositive cases persistently over the years as shown in Figure 2.

Most of the seropositive patients (45% in rural and 57.1% in urban) were high school graduates, whereas 22.5% in rural 21.4% in urban of seropositive patients were illiterate(p = 0.70).Among the rural residents,30% of the seropositive female patients were homemakers while 27.5% males were unemployed; when compared to urban residents, the percentage of homemaker females, unemployed men and truck drivers were 17.8%, 10.7% and 10.7% respectively. Association of occupation with HIV seropositivity was found to be statistically significant (p =0.001).In our study, majority of study subjects were married (77.5% rural & 67.8% urban) whereas, 7.5% HIV positive subjects from rural and 7.1% from urban areas were separated from their spouses (p = 0.78).

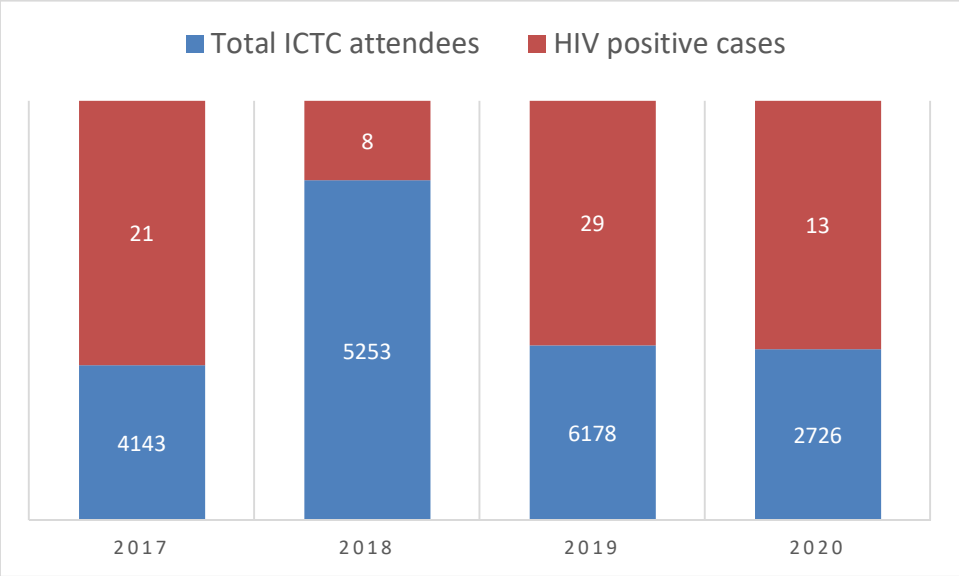


**Fig 1: Trend of total attendees in ICTC and HIV positive cases in last 4 years (2017-2020)**

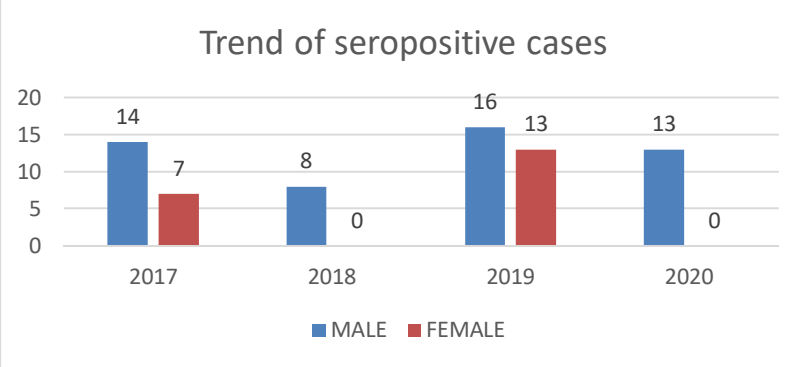


**Fig 2: Trend of sex wise distribution among seropositive ICTC attendees over the last 4 years (2017-2020)**

Sexual transmission (85% in rural and 78.5% in urban) followed by intravenous drug abuse (7.5% from rural and 7.1% from urban)were found to be the most common mode of transmission. Seven point five percent sero positive patients from rural and 10.5% sero positive patients from urban areas could not recall their route of transmission (p = 0.63). HIV-TB coinfection was observed to be 4.7%, 0%, 6.9% and 23% in 2017, 2018, 2019 and 2020 respectively Figure 3. The co-infection rate showed a significant rise after 2018 (p value 0.001).

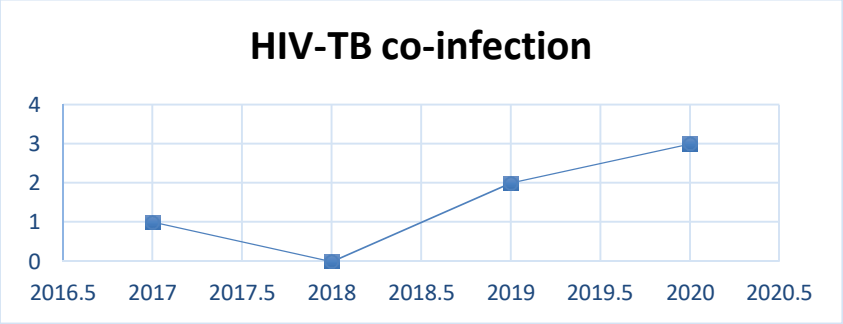


**FIG 3: Figure showing HIV-TB coinfection over the years at the ICTC centre**

**DISCUSSION**

Total ICTC attendees although increased from 2017 to 2019, a substantial fall was noted in 2020. Another study conducted from North India in the year 2019 reflected an overall decline in HIV seropositivity over the years (2016-2018) while the number of ICTC attendees increased [6].COVID-19 has impacted health programs throughout the world, NACP IV is no exception. Recently UNAIDS report also highlighted the fact that it is unlikely that the global HIV targets will be met owing to the COVID-19 pandemic [1]. High-risk groups and migrants, that form a bulk of ICTC attendees, have been impacted severely being one of the most disadvantaged and marginalized, thus explaining the low turnout in 2020.

HIV seropositivity in our study decreased from 0.5 %in 2017 to 0.4% in 2020, however, the decline was not found to be statistically significant ($\chi^2$ = 0.03 and p = 0.8624).Our National HIV estimate report 2019 also highlighted a declining trend in HIV infections over the years [7]. A study conducted in Kolhapur, India also highlighted similar findings, where HIV seropositivity decreased from 1.38% to 0.094%. Similar findings have been reported by other authors as well [6,8,9].

When compared according to place of origin, people from rural areas, constituted a higher percentage of HIV positive ICTC attendees (56.3%) than people from urban areas (39.4%).

Some of the possible reasons could be due to limited access to health care and social services, poor education, isolation due to social stigma and a lack of infrastructure and public transportation. A study conducted in Karnataka, India reported a higher percentage (89.19%) of study subjects were rural areas when compared to urban area (0.65%) [10].

In our study it has been observed that major number of seropositive patients and attendees were malesbelonging to reproductive age group (15-49 years) from both rural (85%) and urban areas (82%). No statistically significant age or sex difference was found between HIV positive patients belonging to rural and urban areas. Reproductive age group, being the sexually most active age group, accounts for major burden of HIV in our country [5,11,12,13].

In our study 22.5% seropositive patients from rural and 21.4% from urban were illiterate, while, most of the seropositive patients (45% in rural and 57.1% in urban) were high school graduates

($\chi^2$= 1.42, p= 0.701). It was observed that majority (27.5% from rural and 10.7% from urban) of HIV seropositive patients were unemployed. A sizeable proportion of females from both urban (17.8%) and rural (30%) population comprised of homemakers. Twelve point five percent and 10.7% seropositive patients from rural and urban area were truck drivers. Study conducted in Kolkata by Rekha Dutt et al showed that 6.2% HIV seropositive patients were truck drivers by occupation and overall 78.1% males were daily wage earner and 44% females were homemaker [5].Truckers and migrant labours are considered as bridge population. Their profession warrants them to stay away from their families for long duration, get involved in promiscuous behaviour and thus get infected with HIV. The bridge population is known to play an important role in HIV transmission [14].

When compared between rural and urban areas, 77.5% and 67.8% of the HIV seropositive patients were married respectively. Similar findings were also observed in a study conducted at Andhra Pradesh by Gerardo Alvarez-Uria et al [15]. A sizeable percentage of study subjects were separated from their spouses (widowed/ divorced) in our study. Having a dissolved marriage (widowed/divorced/separated) was found to be a strong risk factor for HIV transmission by Banandur et al [10].We found heterosexual transmission to be the most common mode of HIV transmission among our study subjects. This result is also similar with the findings of Dahiya N et al, where 90% route of transmission was through heterosexual. A higher percentage of heterosexual route of transmission was also seen in a study conducted by Rashmi M et al [16,17].In a study conducted in South Africa by Shisana et al stated that HIV seropositivity risk was higher in unmarried (15.07%) as compared to married population (10.48%) [18].

In India the most common route of HIV transmission is through sexual mode and majority i.e 90% of females acquire HIV infections from their spouse[3,9].In our study also, majority (85% in rural and 78.5% in urban) of the HIV seropositive patients had sexual route as the most common route of transmission, whereas, 11% of HIV seropositive patients could not specify their mode of transmission.
ICTC provides services for diagnosis and documentation of HIV related co-infections like tuberculosis. HIV-TB coinfection rates were observed to be 5% in 2017, while the rate increased to 23% in 2020 (p= 0.001). A study conducted in Kolkata by Dutt et al showed that 58% HIV positive patients were coinfected with pulmonary tuberculosis [5].Another study from Delhi also reported a very high rate of TB coinfection among HIV positive patients [15]. Human immunodeficiency virus plays a vital role in developing coinfection like active tuberculosis, which dramatically increases the susceptibility to reinfection and primary infection as well as reactivation of the latent tuberculosis [19]. The common feature of immunosuppression in Human immunodeficiency virus infected patients is the significant loss of $CD4^+$ T cells, in the mucosa, lymph nodes and blood which is surely a very important provider to the increased risk of developing active tuberculosis [19,20].
Our study has a few limitations. Ours was a retrospective record-based analysis and therefore a number of important variables like serodiscordance, barrier contraceptive use, co-infection with other STDs, etc. could not be characterized. A prospective study with a larger sample size, additionally analysing the difference between HIV viral load and CD4 count between ICTC attendees from rural and urban area will provide better insight into impact of area of residence on HIV profile of an individual.

## CONCLUSIONS

ICTC provides comprehensive services for diagnosis and management of HIV. The present study provides an insight into the various socio-demographic & risk factors associated with the ICTC attendees visiting a peri-urban hospital in Haryana, India. This study is an attempt to compare the various risk factors and sociodemographic factors among HIV positive ICTC attendees from rural and urban areas as well as highlights the impact of COVID-19 pandemic on HIV.

**Ethics approval and consent to participate:** Prior approval was taken from the Institutional Scientific and Ethics Committee

**Consent for publication:** Written consent was taken from the study participants. Anonymous and unlinked information was collected, as per the National AIDS Control Organization (NACO) guidelines

**Availability of data and materials:** Data supporting the results can be found with the ICTC centre, SGT hospital

**Competing interest:** The authors declare that they have no competing interests

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## AUTHORS' CONTRIBUTIONS

SG Collected the data. SG, TB analysed and interpreted the results and prepared the manuscript. MK supervised the writing of the manuscript and interpretation of results. All authors read and approved the final manuscript.

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